

Java Multithreading Concepts

Spring AU 2021

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The code files have been added as a separate folder.

1. **SingleThreaded.java** (Word count, word frequency, sentence count, paragraph count)
2. **MultiThreadedV1.java** (Word frequency, sentence count, paragraph count)

3 threads performing each task separately

3. **MultiThreadedV2.java** (Word count)

10 Threads using callable and regex for splitting the text

4. **MultiThreadedV3.java** (Word count)

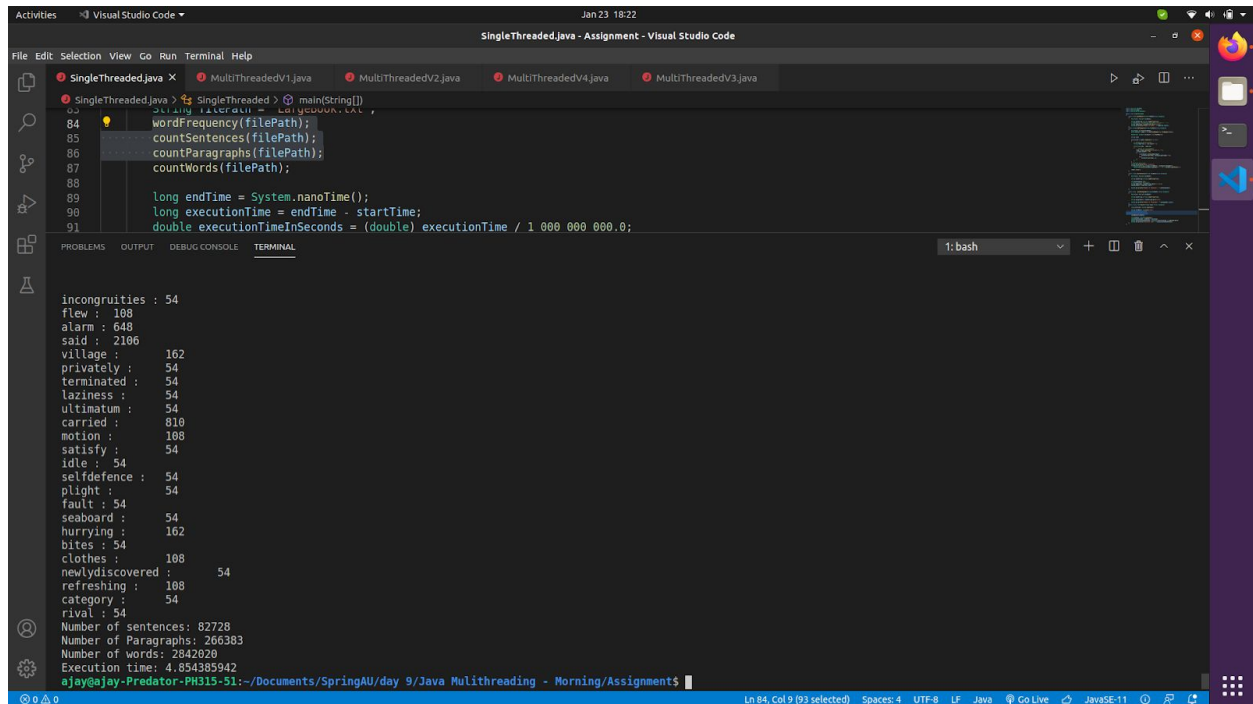
10 Threads extending the Thread class and Substring for splitting the text

5. **MultiThreadedV4.java** (Word count)

10 Threads using callable and substring for splitting the text

Performance comparison:

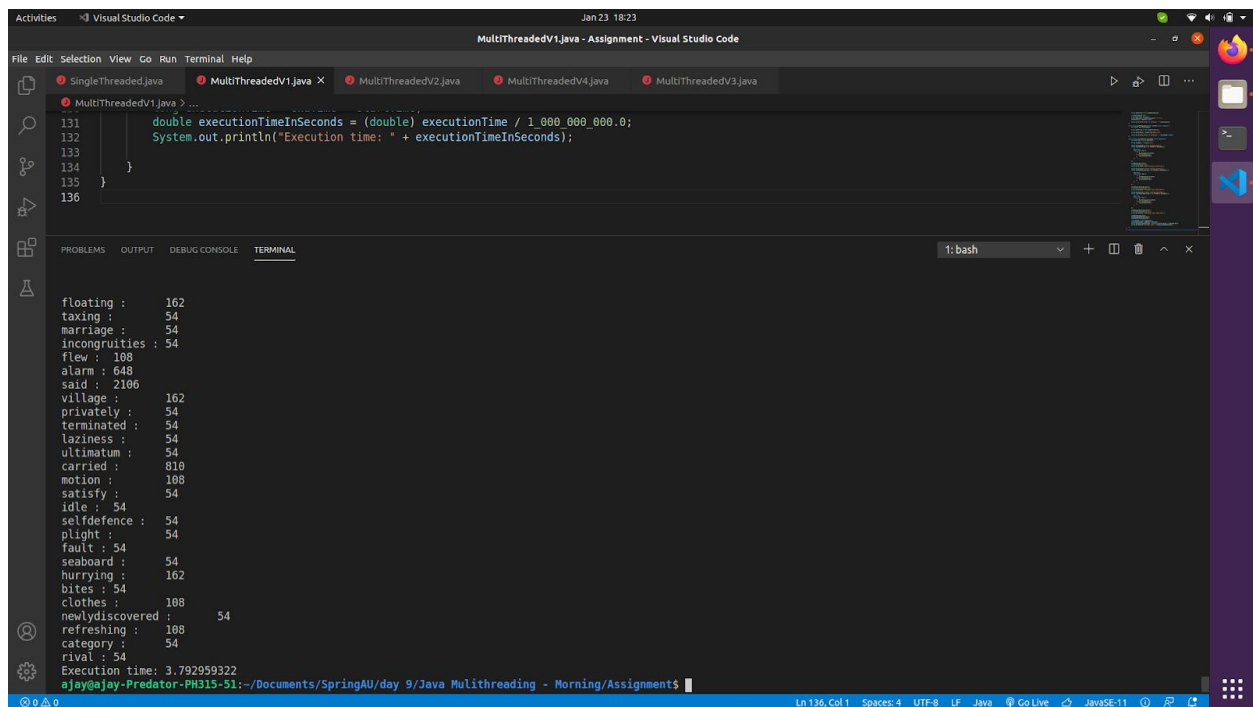
1. Single-threaded all functions(4.85 s) - SingleThreaded.java



```
SingleThreaded.java > SingleThreaded > main(String[])
83 String iteration = LargeWordList;
84 wordFrequency(filePath);
85 countSentences(filePath);
86 countParagraphs(filePath);
87 countWords(filePath);
88
89 long endTime = System.nanoTime();
90 long executionTime = endTime - startTime;
91 double executionTimeInSeconds = (double) executionTime / 1_000_000_000.0;

incongruities : 54
flew : 108
alarm : 648
said : 2106
village : 162
privately : 54
terminated : 54
laziness : 54
ultimatum : 54
carried : 810
motion : 108
satisfy : 54
idle : 54
selfdefence : 54
plight : 54
fault : 54
seaboard : 54
hurrying : 162
bites : 54
clothes : 108
newlydiscovered : 54
refreshing : 108
category : 54
rival : 54
Number of sentences: 82728
Number of Paragraphs: 266383
Number of words: 2842020
Execution time: 4.854385942
ajay@jay-Predator-PH315-S1:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignments
```

2. Multithreaded all functions(3.79 s) - MultiThreadedV1.java



```
MultiThreadedV1.java > ...
131 double executionTimeInSeconds = (double) executionTime / 1_000_000_000.0;
132 System.out.println("Execution time: " + executionTimeInSeconds);
133
134 }
135 }
136

floating : 162
taxing : 54
marriage : 54
incongruities : 54
flew : 108
alarm : 648
said : 2106
village : 162
privately : 54
terminated : 54
laziness : 54
ultimatum : 54
carried : 810
motion : 108
satisfy : 54
idle : 54
selfdefence : 54
plight : 54
fault : 54
seaboard : 54
hurrying : 162
bites : 54
clothes : 108
newlydiscovered : 54
refreshing : 108
category : 54
rival : 54
Execution time: 3.792959322
ajay@jay-Predator-PH315-S1:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignments
```

3. Single-threaded word count - SingleThreaded.java (0.659 s)

```
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$ java SingleThreaded
Number of words: 2842020
Execution time: 0.659607088
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$
```

4. Multithreaded word count v2 - MultiThreadedV2.java (0.800 s)

```
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$ java MultiThreadedV2
Number of words: 2842020
Execution time: 0.800847805
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$
```

5. Multithreaded word count v3 - MultiThreadedV3.java (0.358 s)

```
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$ java MultiThreadedV3
Number of words: 2842029
Execution time: 0.358629536
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$
```

6. Multithreaded word count v4 - MultiThreadedV4.java (0.409 s)

```
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$ java MultiThreadedV4
Number of words: 2842029
Execution time: 0.40913157
ajay@ajay-Predator-PH315-51:~/Documents/SpringAU/day 9/Java Multithreading - Morning/Assignment$
```